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the transmitted light is green ; but when the axis is perpendicular to that plane, the transmitted light is blue. A solution of the salt exhibits the same general action upon light as the solid, with the exception of double refraction. This salt has also the peculiar property of exciting a specific action upon a definite red ray, situated near the extremity of the red portion of the spectrum.

February 19, 1835.

Sir JOHN RENNIE, Knt. Vice-President, in the Chair.

A paper was read, entitled, "On the probable Position of the South Magnetic Pole." By Edward Rudge, Esq., F.R.S., &c.

The recent discovery of the site of the North Magnetic Pole, which has resulted from the experiments of Capt. James Ross, suggested to the author the inquiry whether any similar indications of an approach to the South Magnetic Pole can be gathered from any observations now on record. With this view a table is given of the observations made by Tasman in 1642 and 1643, during his voyage of discovery in the Southern Ocean, extracted from his journal ; from which it appears that he on one occasion noticed the continual agitation of the horizontal needle, in south latitude $42^{\circ} 25'$, and longitude from Paris 160° . On the presumption that the South Magnetic Pole was at that time near this spot, and that it has since been retrograding towards the East, the author conjectures that it will now be found in or about the 43rd parallel of south latitude ; and to the south-east of the Island of Madagascar, a situation extremely convenient for ascertaining its exact position, which he considers as an object of great theoretical as well as practical importance.

The reading of a paper was then commenced, entitled, "An Experimental Inquiry into the Cause of the grave and acute Tones of the Human Voice." By John Bishop, Esq. Communicated by P. M. Roget, M.D., Sec. R.S.

February 26, 1835.

JOHN WILLIAM LUBBOCK, Esq., Vice-President and Treasurer, in the Chair.

The reading of a paper, entitled, "An Experimental Inquiry into the Cause of the grave and acute Tones of the Human Voice." By John Bishop, Esq. Communicated by P. M. Roget, M.D., Secretary to the Royal Society, was resumed and concluded.

The author considers all the theories hitherto proposed respecting the functions of the organs of the human voice, as not only unsatisfactory, but as being founded on erroneous views. He shows that the modulation of the tones of the voice is not the result of variations

either exclusively in the length or in the tension of the vocal chords, or in the size of the aperture of the glottis, or in the velocity or the temperature imparted to the air in its transit through these passages. He regards the organs of the voice as combining the properties of wind and of stringed musical instruments ; and shows, first, that for the production of any musical tone it is necessary that the vocal chords should previously be made mutually to approximate ; and, secondly, that the muscular forces acting on the arytenoid cartilages and vocal chords are adequate not only to resist the pressure of the column of air issuing from the lungs, but also to render either the whole or certain portions of the vocal chords susceptible of vibration when traversed by the current of respired air. In proportion as these parts of the vocal chords, thus rendered vibratory, increase in length, the number of their vibrations, performed in a given time, diminishes, and the tone of the sound emitted becomes, in consequence, more grave ; and, conversely, the tone is more acute as the vibrating portions of the chord are shorter : these phænomena being precisely analogous to those which take place in stringed musical instruments.

The author concludes his paper with some observations on the comparative physiology of the voice ; and on the extensive range and superior excellence of this faculty in man.

The following letter was read ;

British Museum, February 26th, 1835.

MY DEAR SIR,

I am commanded by His Royal Highness the President of the Royal Society to request that you will state from the Chair, at the close of this evening's meeting, how sincerely His Royal Highness regrets that, in consequence of the opinion of Dr. Maton and his other medical advisers, he is obliged, *for the present*, to forego the pleasure, so truly gratifying to himself, of holding the usual Soirées at Kensington Palace. His Royal Highness, however, hopes that, by the blessing of Providence, he may yet have the satisfaction of receiving the Fellows as heretofore, before the termination of the present Session.

I am ever, my dear Sir, faithfully yours,

JOHN GEORGE CHILDREN, Sec. R. S.

John William Lubbock, Esq.
V. P. and Treas. R. S.

March 5, 1835.

Sir BENJAMIN COLLINS BRODIE, Bart., Vice-President, in the Chair.

A paper was read, entitled, " A new Method of discovering the Equations of Caustics." By G. H. S. Johnson, M.A., Tutor of Queen's College, Oxford. Communicated by the Rev. Baden Powell, M.A., F.R.S.

Peculiar difficulty has hitherto attended the determination of the